

What is claimed is:

- 1 (1.) A device for inducing local bone or cartilage formation comprising:
- 2 osteogenic protein;
- 3 matrix derived from non-synthetic, non-polymeric material; and,
- 4 binding agent.
- 1 2. The device of claim 1 wherein said osteogenic protein is selected from the group
- 2 consisting of: OP1, OP2, OP3, BMP2, BMP3, BMP4, BMP5, BMP6, BMP9,
- 3 BMP10, BMP11, BMP12, BMP15, BMP16, DPP, Vg1, Vgr, 60A protein,
- 4 GDF-1, GDF3, GDF5, GDF6, GDF7, GDF8, GDF9, GDF10, GDF11, and amino
- 5 acid sequence variants of each of the foregoing.
- 1 3. The device of claim 1 wherein said osteogenic protein is selected from the group
- 2 consisting of: OP1, OP2, BMP2, BMP4, BMP5, BMP6, and amino acid sequence
- 3 variants of each of the foregoing.
- 1 4. The device of claim 1 wherein said osteogenic protein comprises an amino acid
- 2 sequence having at least 70% homology with the C-terminal 102-106 amino acids,
- 3 including the conserved seven cysteine domain, of human OP1.
- 1 5. The device of claim 1 wherein said osteogenic protein is OP-1.
- 1 6. The device of claim 1 wherein said device comprises at least two different
- 2 osteogenic proteins.

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- 1 7. The device of claim 1 wherein said matrix is selected from the group consisting of:
2 collagen, demineralized bone, apatites, hydroxyapatites, tricalcium phosphates, and
3 admixtures thereof.
- 1 8. The device of claim 1 wherein said matrix is collagen.
- 1 9. The device of claim 1 wherein said device comprises at least two different matrix
2 materials.
- 1 10. The device of claim 1 wherein said binding agent is selected from the group
2 consisting of mannitol, dextrans, white petrolatum, mannitol/dextran combinations,
3 mannitol/white petrolatum combinations, sesame oil, alkyl celluloses, and
4 admixtures thereof.
- 1 11. The device of claim 1 wherein said binding agent is selected from the group
2 consisting of alkylcelluloses.
- 1 12. The device of claim 1 wherein said binding agent is selected from the group
2 consisting of methylcellulose, methylhydroxyethylcellulose, hydroxyethylcellulose,
3 hydroxypropylmethylcellulose, carboxymethylcellulose, sodium
4 carboxymethylcellulose, hydroxyalkylcelluloses, and admixtures thereof.
- 1 13. The device of claim 1 wherein said binding agent is carboxymethylcellulose or the
2 sodium salt thereof.
- 1 14. The device of claim 1 wherein said device comprises at least two different binding
2 agents.
- 1 15. The device of claim 1 further comprising a wetting agent.
- 1 16. The device of claim 15 wherein said wetting agent is saline.

1 17. A device for inducing local bone or cartilage formation comprising:

2 osteogenic protein OP-1, approximately 1.25 mg;

3 collagen matrix, approximately 1000 mg; and,

4 carboxymethylcellulose, approximately at least 180 mg.

1 18. The device of claim 17 further comprising OP-1, approximately at least 2.5 mg.

1 ~~19~~ The device of claim ~~17~~ or 18 further comprising carboxymethylcellulose,
2 approximately ~~at least~~ 200 mg.

1 20. A device for inducing local cartilage or bone formation comprising osteogenic
2 protein and a carrier, wherein said carrier comprises one part (w/w) binding agent
3 to 10 parts (w/w) matrix.

1 21. The device of claim 20 wherein said carrier comprises one part (w/w) binding
2 agent ~~to~~ ^{and} 5 parts (w/w) matrix.

1 22. The device of claim 20 wherein said carrier comprises ~~less~~ ^{fewer} than 5 parts (w/w)
2 matrix.

1 23. A device for inducing local bone or cartilage formation comprising osteogenic
2 protein and a carrier, wherein said carrier comprises 10 parts (w/w) binding agent
3 to 1 part (w/w) matrix.

1 24. The device of claim 23 wherein said carrier comprises ~~less~~ ^{fewer} than 10 parts (w/w)
2 binding agent.

1 25. The device of claim 17, 18 or 19 further comprising saline.

1 26. A method for inducing local bone or cartilage formation for repair of bone,
2 cartilage or osteochondral defects, comprising the step of:

3 providing the device of claim 1, 17, 20 or 23 to a defect site.

1 27. ~~The method of claim 26 wherein bone formation is endochondral bone formation.~~

1 28. The method of claim 26 wherein cartilage formation is articular cartilage
2 formation.

1 29. The method of claim 26 wherein said defect site is selected from the group
2 consisting of: critical size defect, non-critical size defect, segmental nonunion
3 defect, nonunion fracture, fracture, osteochondral defect, and subchondral defect .

1 30. The method of claim 26 wherein the volume of osteogenic device provided to the
2 defect site is sufficient to fill the defect site

1 31. A device for inducing local bone or cartilage formation comprising:

2 osteogenic protein OP-1;

3 collagen matrix; and

4 carboxymethylcellulose.

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1 32. A kit for inducing local bone or cartilage formation using the device of claim 1, the
2 kit comprising:

3 (a) a receptacle adapted to house an osteogenic protein and a matrix
4 material, and

5 (b) a receptacle adapted to house a binding agent,

6 wherein the osteogenic protein and matrix material are provided in the receptacle
7 of part (a), and the binding agent is provided in the receptacle of part (b).

1 33. The kit of claim 32 further comprising a receptacle adapted to house a wetting
2 agent.

1 34. The kit of claim 32 or 33 wherein said receptacle of part (a) and part (b) comprise
2 a single receptacle.

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